

Groundwater Concerns

1. **N, E** Insufficient groundwater data collected to establish background conditions.
2. **N, E, R** Insufficient groundwater monitoring to establish performance of site; should have a well at each site. **Won't measure deep groundwater (> 6 ft) or model GW flow patterns. Use of deep monitoring wells introduces too much variability and has no value for project monitoring campaign. Will monitor soil water. A detailed analysis and evaluation of nitrate transport to groundwater below root zone range is not beneficial to project outcome.**

Flaws with Project Design

3. **E** NRCS standard for winter application prohibits manure application when soil nitrate exceeds 60 lb/acre.
4. **E, R** Risk factors not protective of receiving waters, groundwater or shellfish beds, ex. permeable soils are rated as "low risk"; "low risk" areas are high risk areas for groundwater contamination. **Will work with project partners to make sure all risk factors and evaluations are comprehensive and addressed in a scientifically responsible manner.**
5. **E, R** Ground Water Quality Standards for nutrient application require storage capacity during non-growing season, ARM doesn't address storage issue if conditions do not allow for application.
6. **E** Should avoid sites where groundwater nitrate-N exceeds 5 mg/L and fall soil nitrate exceeds 15 mg/kg, Phosphorous index is high or very high, or where vegetation is sparse.
7. **E, L, R** Scale back project size.
8. **E** Include Ecology and other Stakeholders when implementing ARM plans beyond 8 test sites.
9. **E, L** Weather forecasts are unpredictable, how will "significant" precipitation be determined.
10. **E, L** Fecal coliform can run off with precipitation occurring more than 3 days after application.
11. **E, R** Greater documentation of nutrient utilization is needed, including: soil nitrate available for winter crop, soil organic nitrogen available, expected winter mineralization rate of soil organic nitrogen, expected resulting nitrogen available for winter plant uptake from soil organic nitrogen, amount of nitrogen needed to meet winter crop needs and the source of nutrients, manure organic nitrogen concentration, expected winter mineralization rates and amount of manure organic nitrogen available for plan uptake.
12. **E, R** Soil water is not a surrogate for groundwater and is not easily accurately measured.
13. **E, L** Only low risk areas should be test targets.
14. **E** Fecal coliform sampling should occur at each study site and emphasize precipitation events.

15. **E** Manure samples need to be collected at each application event throughout the project, not just years 1 and 2.
16. **E** Accurate estimates of manure volume are needed for nitrogen loading estimates at each manure application
17. **L** How will manure application rates be determined?
18. **R** Monitoring should be done on each field before and after application.
19. **E** Composite sampling every 10,000 is too infrequent.
20. **E** Crop yield reporting 4-6 times per year for grass fields. This should occur at all test fields.
21. **E** Require farms to have up to date farm plans.
22. **E** Recertify NMPs and make available to Ecology and Ag for inspection.
23. **E** Permitted CAFOs would only be eligible in plans are revised and reviewed and approved by Ecology.
24. **E** Implement vegetative buffers that meet NRCS FOTGs to reduce sediment, sediment absorbed contaminants and dissolved contaminants at locations where surface waters or conduits to surface or ground waters exist. **Outside scope of project. See next response.**
25. **E** Setbacks should be consistently applied in conjunction with vegetative buffers. **Outside scope of project. All dairies are required, however to have a NRCS approved vegetative practices and setbacks.**
26. **E** Monitor harvested crop nitrogen
27. **L** How is “water table too high,” defined?
28. **L** How will agronomic rate for winter application be determined?

Project Evaluation

29. **E, R** Does not define how success of system will be evaluated
30. **E, R** Does not define how impact on groundwater, surface water and shellfish will be evaluated
31. **E** Says paired tests will be used “when applicable.” How is this defined and what is the evaluation alternative when a paired test is not used?
32. **E** Work with WA licensed hydrogeologist to design groundwater monitoring and to analyze results according to USGS protocols.
33. **L** How will survey data be managed?

Guarantees that contamination won't occur

34. **N, L** No indication of what follow-up actions will be taken if there is fecal contamination of shellfish beds.
35. What assurances are there that the system will be properly implemented?

Misc.

36. **N, L** Tribal response to project should not be considered “positive.”
37. **E** Concept of applying nutrients in appropriate conditions and in appropriate amounts is already part of dairy NMPs and NRCS standards, dropping winter cutoff date will not improve upon these.
38. **E** Training and oversight are needed to ensure producers conduct assessments according to standard procedures developed for the risk assessment and apply amounts of nitrogen needed by the crop.
39. **E** Most long term sampling locations in the Nooksack watershed don’t currently meet the fecal WQS, including areas under a fecal TMDL that are most sensitive during winter months.
40. **R** Project area is already suffering from contaminated groundwater.
41. **E** Complex chemical, biological and physical systems in soil and groundwater make predictions about impacts of winter manure applications uncertain. **True at any time of the year. The point of the arm worksheet is to evaluate the specific characteristics related to natural systems and help identify and avoid risk associated with application of manure to that system. The collection of field data will help us refine and optimize the risk calculations associated with the worksheet to reduce uncertainty and base our recommendations on sound science, not predictions.**
42. **E** Ecology is concerned that enforcement actions will be necessary against producers in project.
43. **L** Says producers not following protocol are subject to enforcement actions. Are agencies responsible for enforcement willing to provide a credible presence?
44. **L** Is CD capable of providing a high level of oversight and testing to 40 farms?
45. **L** Current monitoring program of stationary monitoring sites that are referenced as providing background conditions is too limited to provide reliable background info.
46. **L** Will DNMPs be publically available?
47. **L** Says a “constant evaluation” of ARM system will be conducted by CD. What does this mean?
48. **R** The real problem is lagoon storage capacity.
49. **R** Any wet season application should be considered a discharge and should require a permit by Ecology, which necessitates adequate storage capacity.
50. **R** Any winter application in this area is too risky, and not worth the minimal benefit.

Problems with QAPP content

51. **E, L** QAPP does not provide enough background info on ARM, inc. references, soil and field characteristics, methods and criteria for risk rating, track record of system, typical schematic for sampling.
52. **E** Detailed SOPs are needed for each media to be sampled (manure, soil, groundwater, surface water, forage, air).
53. **E** Analytical methods need to be referenced.

- 54. **E** The soil sampling should follow the Sullivan and Cogger (2003) protocol of 15-30 soil cores per field to characterize soil nitrate. A specific time frame for sampling prior to manure application is needed.
- 55. **E, L** Soil sampler should be sterilized between sites for fecal samples
- 56. **E** Indicated agricultural methods are not accredited by Ecology.
- 57. **E** DQIs are not quantitative. Each method should have its own experimentally determined or literature derived set of DQIs.
- 58. **E** QA officer for project must have relevant training.